instruction manual

800 SERIES
AC
HIPOT TESTERS

SORENSEN
A Unit of Raytheon
Richards Avenue, South Norwalk, Connecticut

MP MASTER
MA25374

RETURN TO
CALIBRATION & SECONDARY
STANDARDS LABORATORY

M15036X

GENERAL INFORMATION

PLEASE READ THIS MANUAL. We think it will help you to obtain the maximum performance from your new Sorensen instrument.

SHIPPING DAMAGE

Sometimes instruments are damaged in transit. We strongly suggest that you inspect and test your instrument as soon as you receive it. If the instrument is damaged or if it fails to operate properly, you should ask the carrier to inspect the shipment. The carrier's claim agent will prepare a report of damage which you should send to us. We will then tell you how to have the instrument repaired or replaced.

SERVICE INFORMATION

If you have any questions about the operation, repair, or servicing of a Sorensen instrument, please contact our local representatives. (A list of representatives appears at the rear of this manual.) If it is more convenient you may contact us directly at the Service Department, Sorensen, Richards Avenue, South Norwalk, Connecticut.

IMPORTANT

BE SURE TO INCLUDE THE MODEL & SERIAL NUMBER IN ALL CORRESPONDENCE CONCERNING THIS INSTRUMENT. WITHOUT THIS INFORMATION WE MAY NOT BE ABLE TO GIVE YOU PROMPT AND ACCURATE SERVICE.

RETURNS TO THE FACTORY

Should you decide to return an instrument to us for repair, please contact us for authorization to make shipment. We have a number of local service facilities in the United States and Canada which are equipped and staffed to provide you with fast, efficient service. For this reason, we reserve the right to refuse unauthorized shipments to our plant.

WARRANTY

This instrument is warranted by Sorensen/Unit of Raytheon, to be free from defects in material and workmanship. Our obligation under the warranty is limited to servicing the instrument and replacing defective parts* when the instrument is returned to the factory with transportation charges prepaid. No other warranties may be implied. The period of warranty is one year after the delivery of the instrument to the original purchaser. Defects caused by improper operating conditions, accidents, misuse, negligence, and the alteration or removal of the nameplate, will void the warranty.

*With the exception of tubes and fuses.

MODEL

821 AND 822

AC

HIPOT TESTERS

TABLE OF CONTENTS

	Page
I. General Information	(Inside Cover)
II. Specifications	2
III. Installation & Operation	3
IV. Principle of Operation	5
V. Maintenance & Repair	5

Sorensen/A Unit of Raytheon Co., Richards Ave., So. Norwalk, Connecticut
A14-3847
1/61

II. SPECIFICATIONS

The "800" Series Portable AC Hipot Testers are exceptionally compact, light weight, and economical. They feature direct-reading kilovoltmeter, complete self and personnel protection, and continuously variable voltage over the entire output range.

MODEL		821	822
INPUT POWER		117 VAC Nominal 60 Cps. 1 Phase	
		Maximum Line 125 VAC	
	CURRENT	1 Ampere Maximum	
OUTPUT POWER	VOLTAGE	0-3000 VAC-RMS	0-7500 VAC-RMS
	CURRENT (NOMINAL INPUT)	0-10MA RMS at 2300VAC	0-10MA RMS at 6000VAC
		0-4MA RMS at 3000VAC	0-4MA RMS at 7500VAC
BREAKDOWN CURRENT		1-10 MA RMS	
SHORT CIRCUIT CURRENT		18 MA RMS Maximum	
AMBIENT TEMPERATURE		Range 15°C (59°F) to 40°C (104°F)	
CABINET SIZE (INCHES)	Width	6 1/8	6 1/8
	Height	8 1/2	8 1/2
	Depth	10 1/2	10 1/2
WEIGHT (Net)		12 Lbs.	12 Lbs.

III. INSTALLATION AND OPERATION

CALIBRATION

1. Always operate with a good external ground. The cabinet should be grounded by means of the ground post, before any other connections are made. Wire, of at least #14 gauge, should be used.

2. Input power is applied by means of a line cord utilizing a 117 volt polarized three prong plug. The round prong of this plug is grounded at the receptable and thus provides input ground to the chassis. If a two prong adapter is used, the third wire must be grounded to the receptacle.

   Be sure that the front panel high voltage control is at zero (counter clockwise).
   Insert the line cord plug into a 117 volt, single phase, 60 cycle system.
   "On-Off" switch should be in the "off" position.*

3. Insert an AC milliameter between the high voltage output and ground. Connect the low end lead to the ground side of the milliameter. Protect the meter with a glow lamp.
   See Figure #1.

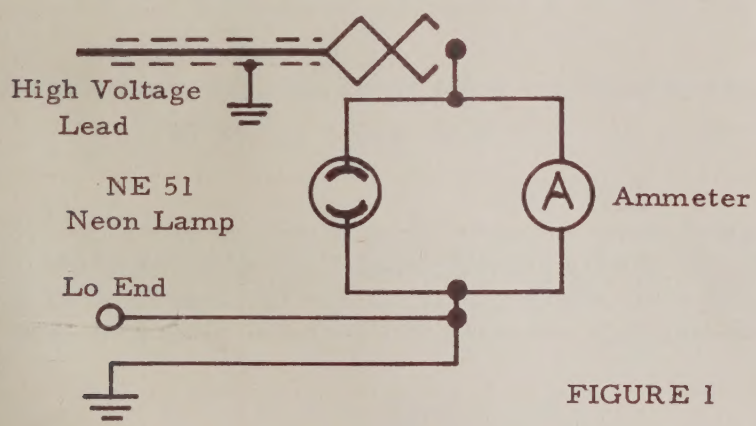


FIGURE 1

4. Set the "On-Off" switch to the "ON" position.

5. Raise the output current to the desired value (1 ma to 10 ma) by slowly turning the front panel high voltage control.

6. Adjust the "current adjust" pot at rear of the cabinet until the "breakdown" neon lamp glows.

7. Set the "On-Off" switch to the "Off" position and disconnect the milliameter and its parallel neon lamp.

* It is good practice to turn the high voltage control to zero and the "on-off" switch to the "off" position when the tester is not in use.

8. The tester is now ready to operate.

OPERATION

1. Always operate with a good external ground. The cabinet should be grounded by means of the ground post at the rear of the chassis. Wire, of at least #14 gauge, should be used.

2. Connect the line cord to a 117 volt single phase, 60 cycle system. (High voltage control at zero). If a two prong adapter is used, the third wire must be grounded to the receptacle.

3. Calibrate the instrument, if necessary, to the desired breakdown value.

4. Turn the high voltage control to zero. Insert the test sample between the high voltage output lead and the low end lead.

5. Set the "On-Off" switch to the "On" position.

6. Raise the output voltage to the desired value by means of the high voltage control.

7. Lighting of the breakdown indicator lamp shows that the preset current has been reached.

CAUTION

The metal ferrule, which terminates the shielding at the clip end of the high voltage cable, might be 100 volts above ground. This can happen if the output is shorted. The insulating tape covering this ferrule, should be kept intact at all times.

IV. PRINCIPLE OF OPERATION

The AC High pot tester is basically a high voltage step-up transformer which will saturate to limit the output current. Please refer to the schematic diagram included in this manual.

The output voltage is adjusted by means of the variable autotransformer T1 which determines the primary voltage of T2.

The operation of the "breakdown" current indicator is as follows:
For a predetermined load current, R1 is adjusted so that the voltage drop across R1 and R4, in series, equals the igniting voltage of lamp I2. Therefore, the lamp I2 indicates current at or above the calibrated load current.

Vacuum tube V1 is a protective device used to prevent large voltages from appearing across the indicating circuit, if the output of the tester is short circuited.

C1 and C2 are protective devices, in the event that the instrument is not grounded properly. Note: Both the input and the output must be grounded.

V. MAINTENANCE AND REPAIR

During normal life this instrument requires no maintenance other than the care afforded similar equipment. Special care should be taken of the high voltage cable to prevent exposure of the metal shield directly beneath the outer insulation.

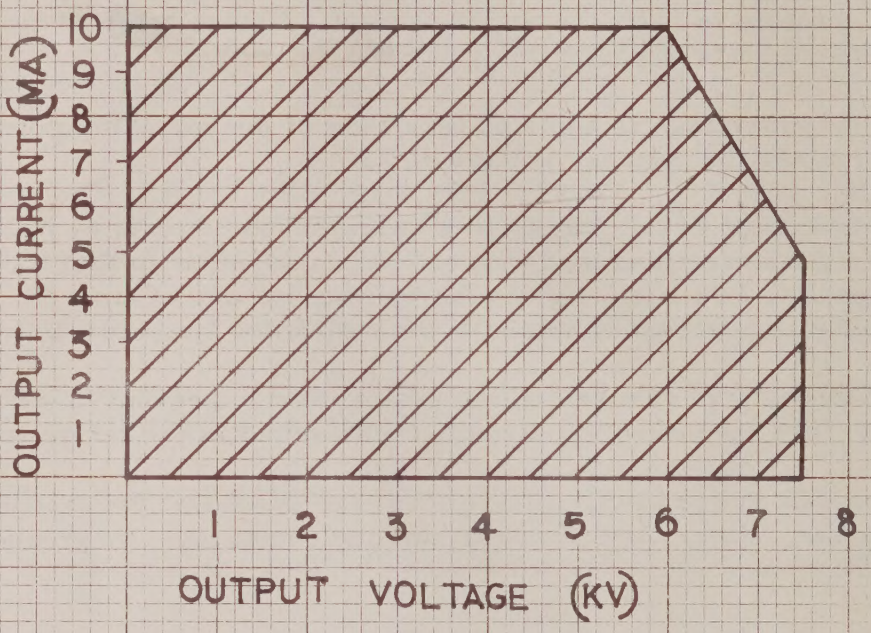
SPARE PARTS

All components used in these instruments are of a good commercial grade and can be expected to give a reasonably long period of trouble free service. We suggest that the components recommended as spares, on the Replacement Parts List, be kept on hand.

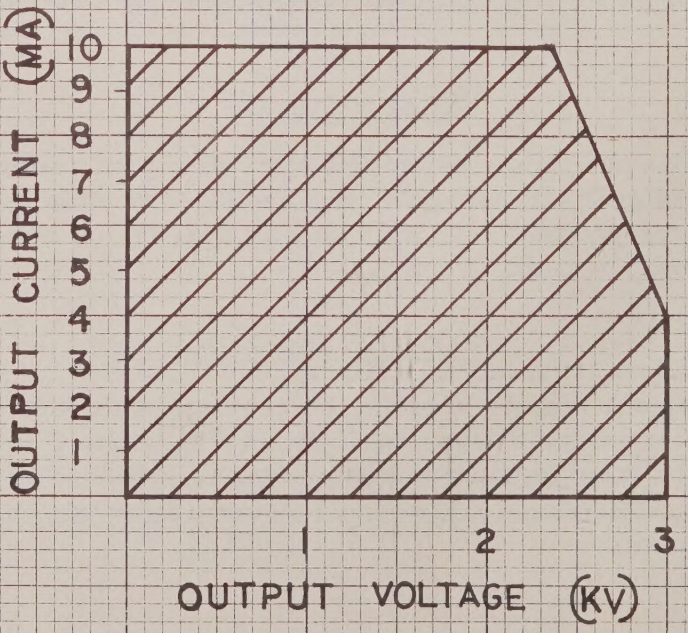
TROUBLE SHOOTING

Before attempting any trouble shooting or repair of this instrument, be sure that the unit is disconnected from the line. We suggest, if resistance checks do not disclose the trouble, that the instrument be returned to the factory or one of its representatives. (Please read General Information, inside the front cover of this manual).

MODEL 822
TYPICAL OPERATING AREA
(NOMINAL INPUT)



MODEL 821
TYPICAL OPERATING AREA
(NOMINAL INPUT)



REPLACEMENT PARTS LIST

MODEL 821

SERIAL NO. 1 TO _____

LIST No. A14- 384

SCHEMATIC SYMBOL	RECOMM. SPARES	DESCRIPTION	FUNCTION	SORENSEN PART No.	MANUFACTURER
F 1	5	FUSE, 1A FUSE HOLDER	LINE OVERCURRENT	42-880 42-463	BUSSMAN AGC BUSSMAN HKP-E
I 1	2	NEON LAMP	H.V. ON	42-301	GENERAL ELECTRIC #NE51
I 2		NEON LAMP	BREAKDOWN	42-301	GENERAL ELECTRIC #NE51
M 1		K.V.METER	OUTPUT VOLTAGE	94-545	PER SORENSEN B94-545
C 1, C 2		CAPACITOR	R.F. BY-PASS	24-121	SPRAGUE TM-11
R 1		POT., 50K, ±5%, 4 W	BREAKDOWN CURRENT ADJUST	29-361	CLAROSTAT SERIES 10M
R 2		RES., 15 M, ±3%	METER MULTIPLIER	28-1027	RPC, 15M, BAKW ±3%
R 3		RES., 220K, ±5%	METER PROTECTIVE SHUNT	27-170	ALLEN BRADLEY EB2245
R 4		RES., 4.3 K ±5%, 2 W	MIN.RESISTANCE FOR BREAKDOWN	27-345	ALLEN BRADLEY HB4325
T 1		TRANSF.VARIABLE	OUTPUT VOLTAGE ADJUST	91-953	SUPERIOR #10B
T 2		TRANSFORMER	H.V.TRANSFORMER	91-1204	GENERAL ELECTRIC SUPPLY CORP 9T61Y5038
V 1	1	TUBE	BREAKDOWN CIRCUIT OVERVOLTAGE PROTECTION	12-001	RAYTHEON #0B2

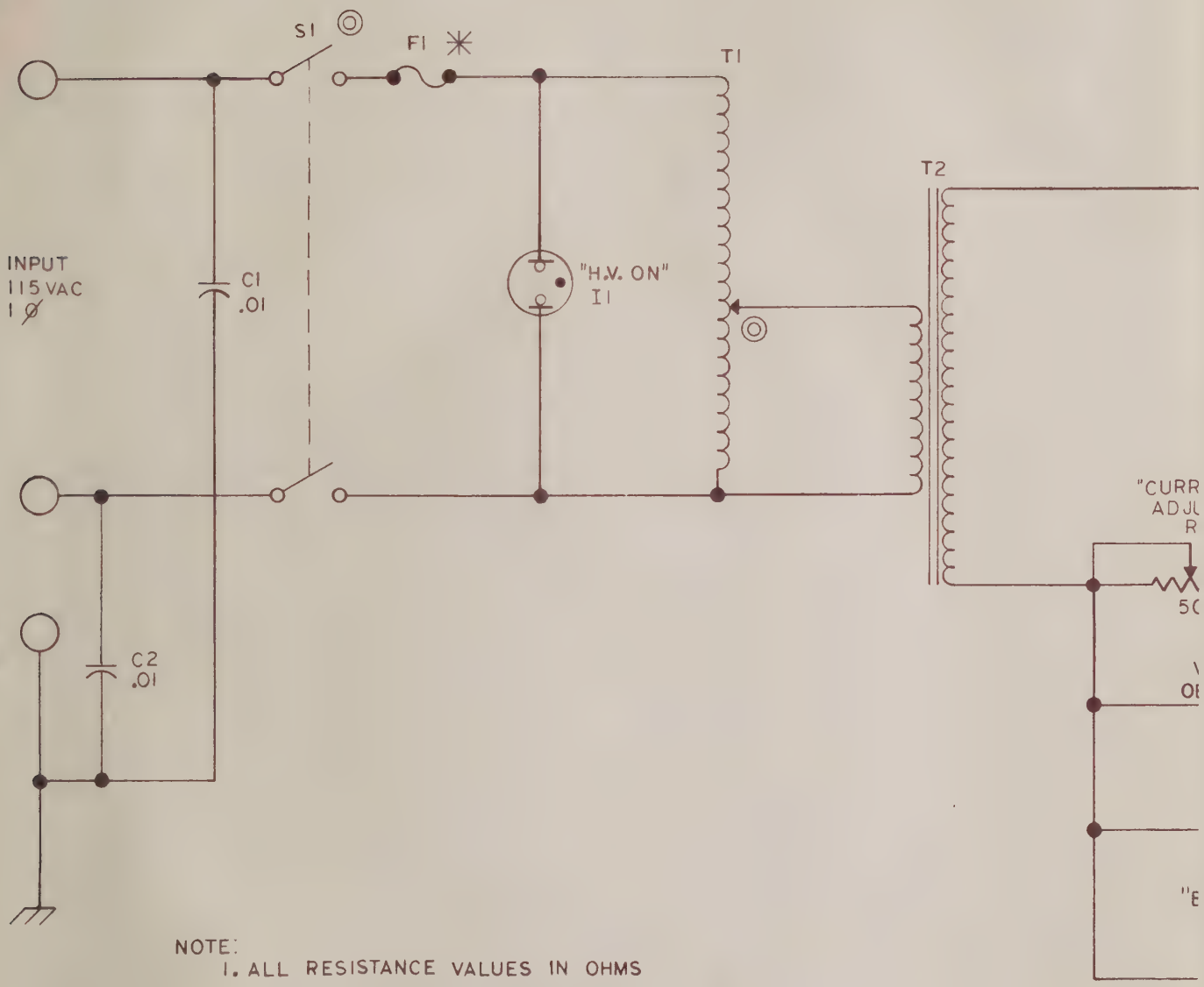
REPLACEMENT PARTS LIST

MODEL 822

SERIAL NO. 1 TO _____

LIST No. A14- 3849

SCHEMATIC SYMBOL	RECOMM. SPARES	DESCRIPTION	FUNCTION	SORENSEN PART No.	MANUFACTURER
F 1	5	FUSE, 2A	LINE OVERCURRENT	42-408	LITTLEFUSE 31201-6 BUSSMAN AGC-2
		FUSE HOLDER		42-463	BUSSMAN HKP-E
I 1	2	NEON LAMP	H.V. ON	42-301	GENERAL ELECTRIC #NE51
		NEON LAMP	BREAKDOWN	42-301	GENERAL ELECTRIC #NE51
M 1		K.V.METER	OUTPUT VOLTAGE	94-544	PER SORENSEN B94-544
C1, C2		CAPACITOR	R.F.BY-PASS	24-121	SPRAGUE TM-11
R 1		POT., 50K, ±5%, 4W	BREAKDOWN CURRENT ADJUST	29-361	CLAROSTAT SERIES 10M
R 2		RES., 40M, ±3%	METER MULTIPLIER	28-1025	RPC, 40M, BBR 3%
R 3		RES., 220K, ±5%	METER PROTECTIVE SHUNT	27-170	ALLEN BRADLEY, EB2245
R 4		RES., 4.3K, ±5%, 2W	MIN.RESISTANCE FOR BREAKDOWN	27-345	ALLEN BRADLEY, HB4325
T 1		TRANSF.VARIABLE	OUTPUT VOLTAGE ADJUST	91-953	SUPERIOR #10B
T 2		TRANSFORMER	H.V.TRANSFORMER	91-1197	GENERAL ELECTRIC SUPPLY CORP. 9T61Y5534
V 1	1	TUBE	BREAKDOWN CIRCUIT OVERVOLTAGE PROTECTION	12-001	RAYTHEON OB2

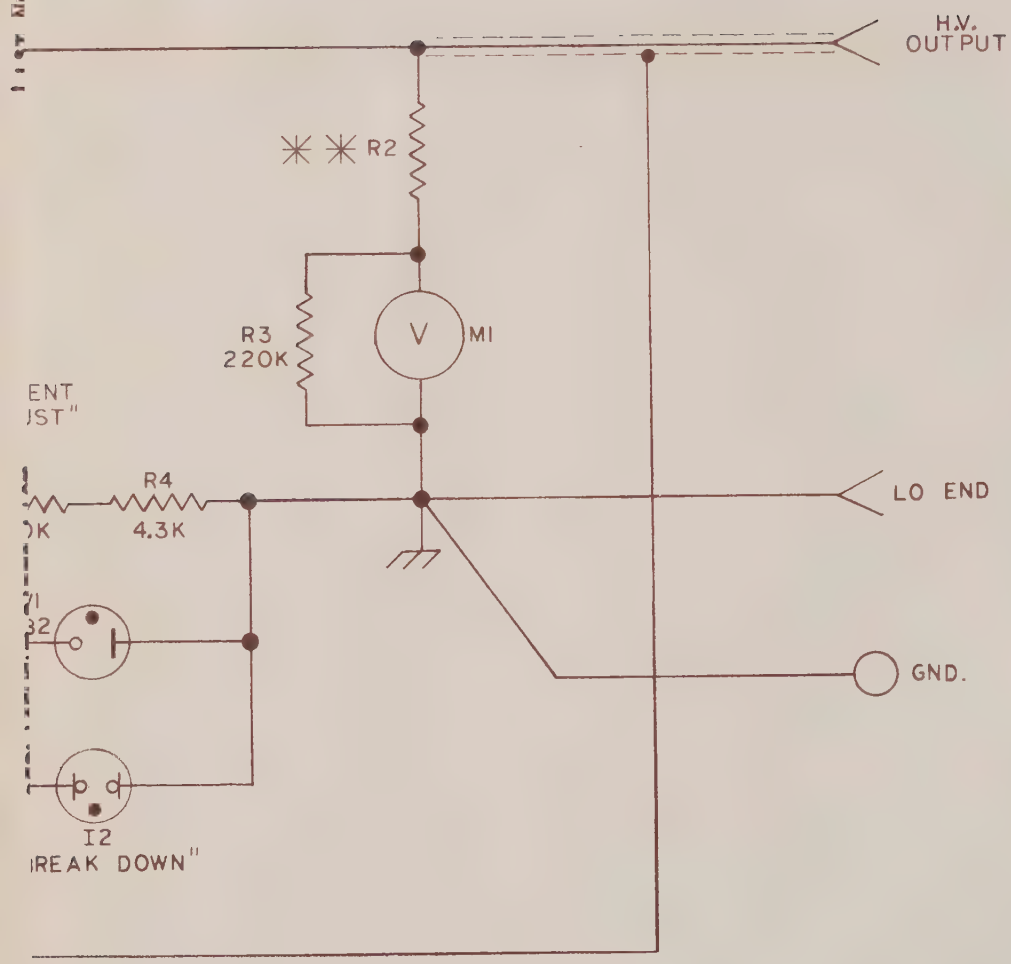


NOTE:

1. ALL RESISTANCE VALUES IN OHMS
   K = 1000
   M = MEG.
2. ALL CAPACITANCE VALUES IN MFD.
3. ◎ PANEL CONTROL

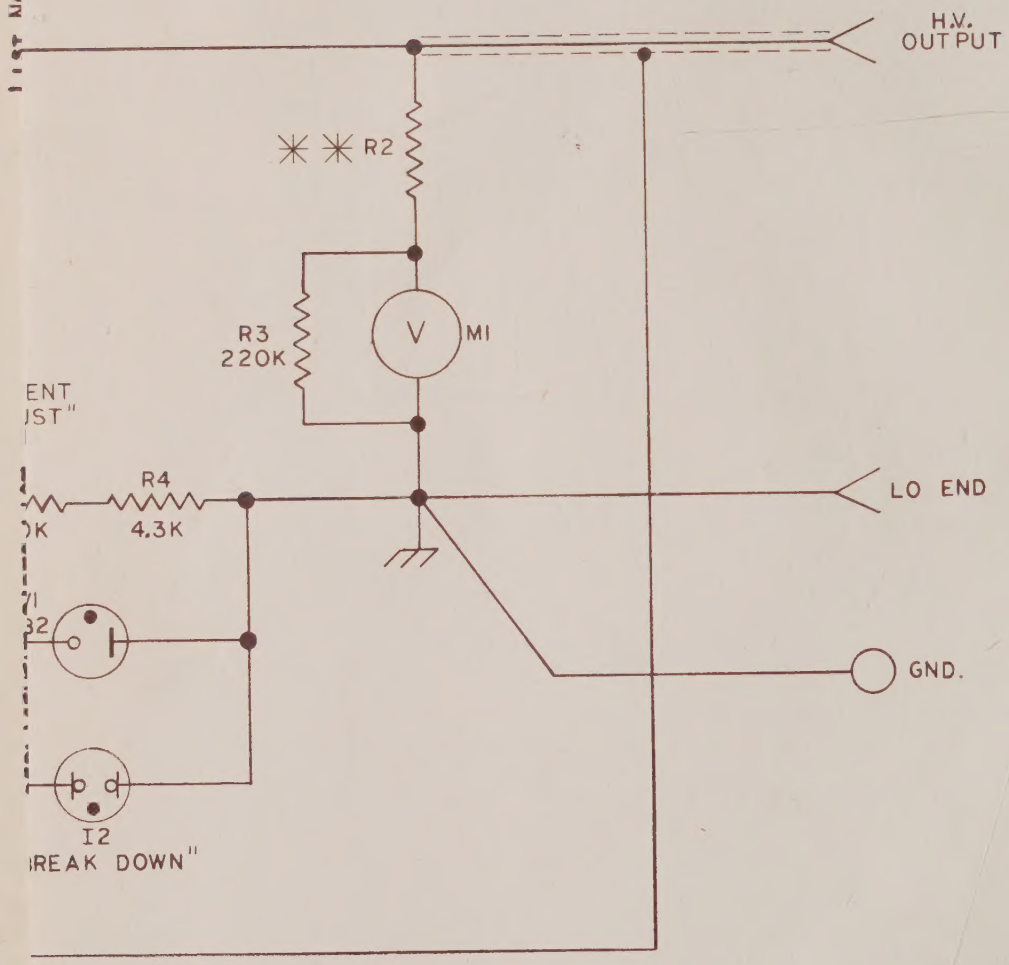
✳ F1 { MODEL 821 = 1A
       MODEL 822 = 2A

✳✳ R2 { MODEL 821 = 15 MEG
        MODEL 822 = 40 MEG



SCHEMATIC
MODEL 821
AND
MODEL 822

NOTES



SCHEMATIC
MODEL 821
AND
MODEL 822

NOTES

MP MASTER
MA25374